CAI-2006-18

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION
COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Underground Coal Mine

Fatal Rib Roll Accident
February 1, 2006

#18 Tunnel Mine
Long Branch Energy
Wharton, Boone County, West Virginia
ID No. 46-08305

Accident Investigators

Gerald L. Cook, Sr.
Coal Mine Safety and Health Inspector

Douglas W. Johnson
Coal Mine Safety and Health Inspector

Charles W. Cline
Coal Mine Safety and Health Inspector Roof Control

Originating Office
Mine Safety and Health Administration
District 4
100 Bluestone Road
Mount Hope, West Virginia 25880
Jesse P. Cole, District Manager

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OVERVIEW

At approximately 12:40 p.m. on Wednesday, February 1, 2006, a 46-year old roof bolting machine operator was fatally injured from a rib roll which occurred in the number five entry of the 4 Left Mains section. As the roof bolting machine operator was preparing to drill a hole in the mine roof to install permanent roof support, a large portion of the right rib fell, pinning the victim.

The accident was caused by failure to effectively control the ribs on the active section which exposed the victim to loose, hazardous rib conditions. The coal ribs on the active section were not being supported in accordance with the approved roof control plan. The approved roof control plan requires loose ribs to be either removed or supported. All five entries and cross-cuts of the active, working section exhibited deteriorating rib conditions. The equipment used to install permanent roof support on the active section required the roof bolting machine operator to be positioned between the machine and the hazardous rib condition.

GENERAL INFORMATION

The #18 Tunnel Mine, I.D. No. 46-08305 is located near Wharton, in Boone County, West Virginia. The underground mine employs 61 persons of which 57 are underground employees. The room and pillar method of mining is utilized, mining on advance. The mine is operated in the Powellton bituminous coal seam, which is accessed by a slope from the No. 2 Gas coal seam. An overlying mine is present in the No. 2 Gas coal seam which is located approximately 65 feet above the #18 Tunnel Mine.

The #18 Tunnel Mine has one active continuous miner section which produces coal on the day and the afternoon shifts. Maintenance is performed on the midnight shift. Shuttle car haulage is employed at the face areas. The mine produces approximately 375,000 tons annually.

The principal officers for the mine at the time of the accident were:

Greg Patterson.....President
Phillip R. Ball.....Superintendent and Safety Director
Elmer Bourne.....Mine Foreman

Miners employed at the #18 Tunnel Mine are represented by the United Mine Workers of America (UMWA), District 17, Local 781.

The last regular inspection of the mine by the Mine Safety and Health Administration (MSHA) was completed on December 30, 2005. An inspection was started on January 25, 2006 and was ongoing at the time of the accident. The NFDL rate for the mine was 12.44 in 2005. The national NFDL rate for mines of this type was 5.03 in 2005.

DESCRIPTION OF THE ACCIDENT

The 4-Left Mains section crew entered the mine on February 1, 2006, at their normal starting time of 6 a.m. under the supervision of Steve Lafferty, section foreman. At the start of the shift, Lafferty warned the crew that the ribs were bad in the number four and number five entries.

The crew arrived on the active section, and the continuous mining machine, operated by Randy Brogan, began mining in the number two entry. A second cut was then taken from the number one entry, and the continuous mining machine was moved to the number five entry for a third cut.

Brogan started mining the cut in the number five entry, and then went to lunch. Leroy Miller, continuous mining machine helper, was given control of the continuous mining machine and completed the cut. Miller shortened the depth of the cut down to 22 feet due to obviously poor rib conditions. This was a common practice when poor rib conditions were encountered. Upon completion of the cut, Miller used the continuous mining machine, to “rub” both the left and right coal ribs twice. The practice of “rubbing” a rib

involves moving the continuous mining machine along the outside edges of the entry to scrape loose material away from the rib.

Timothy Vance and Edmund Vance, roof bolting machine operators, first installed permanent roof support in the number two entry. The roof bolting machine was moved to the number one entry to install permanent roof supports in the newly created cut. Their work progression followed the cuts taken by the continuous mining machine.

When the continuous mining machine completed the cut in the number five entry, Miller warned the roof bolting machine operators to be careful due to poor rib conditions. Timothy Vance operated the left side of the twin head Fletcher Roof Ranger DDO-13 roof bolting machine, and Edmund Vance operated the right side of the machine. After receiving instructions from Lafferty, Timothy Vance moved the roof bolting machine into the number five entry, outby the newly created cut, and installed some additional roof bolts along the left rib where the entry had widened due to fallen rib material. Initial observations in the number five entry indicated the left rib was in worse condition than the right rib.

Timothy Vance scaled down some loose material along the left rib, and then moved the roof bolting machine into the face area to begin installing permanent roof support. At this time, both the left rib and the right rib appeared to be solid. The first row of permanent roof support was installed, and a test hole was drilled. Lafferty and James Jackson, scoop operator, arrived with a load of roof bolting supplies and began to place them on the roof bolting machine.

As Timothy Vance and Edmund Vance continued to install the permanent roof support, some rib "popping" near the face was heard. As Timothy Vance was about to begin installing the outer roof bolt, nearest the left rib, a large portion of the right rib fell, pinning Edmund Vance. Timothy Vance ran around the roof bolting machine to help Edmund Vance. Lafferty, whose back was turned to the roof bolting machine as he loaded supplies onto the roof bolting machine, turned and observed the fallen rib material. The fallen rib material had trapped Edmund Vance against the roof bolting machine. Lafferty, Jackson, and Timothy Vance removed the fallen material off of Edmund Vance and administered first aid.

Lafferty then called outside using the mine phone to report the accident and call for an ambulance. The victim was transported via mantrip from the active section to the surface of the mine. Near the working section, Elmer Bourne, Mine Foreman and Emergency Medical Technician, began rendering additional aid and continued to provide aid en route to the surface. Upon reaching the surface, the victim was transported by Boone County Ambulance Authority to Boone Memorial Hospital.

INVESTIGATION OF THE ACCIDENT

MSHA was notified at 1:10 p.m. on February 1, 2006, that a serious accident had occurred at the #18 Tunnel Mine. MSHA personnel from the Madison, West Virginia

Field Office traveled to the mine, and issued a 103(k) order to ensure safety of all persons during the accident investigation. MSHA accident investigators accompanied by the West Virginia Office of Miner's Health, Safety, and Training (WVOMHST), the mine operator, and UMWA representatives proceeded underground to begin the physical portion of the investigation. Photographs, measurements and sketches were created and the underground portion of the investigation was completed on Saturday, February 4, 2006. On February 3 and 4, 2006 interviews were conducted at the MSHA Madison Field Office. A list of those persons who participated in the investigation can be found in Appendix A.

DISCUSSION

Human Factors

Edmund Vance had no known physical impairments or medical conditions that would have contributed to the accident. Edmund Vance had 27 ½ years of mining experience, and had been employed at this mine for approximately 2 ½ years. He had operated a roof bolting machine at this mine for the past three months.

Geological Conditions

Mining height on the active section ranged from seven to ten feet. Rib conditions on the active section area indicated increased overburden pressure was resulting in severe rib control problems. Overburden depth of the active section was in excess of 1,100 feet. Additionally, some mining had been conducted in the No. 2 Gas seam, located approximately 65 feet above the Powellton Seam. The No. 2 Gas mine was not directly above the accident scene; but was approximately 80 feet horizontally from the location of the accident. Large offset blocks were left in the No. 2 Gas mine which resulting in overburden pressure loading to the Powellton mine works.

The mining height at the site of the accident was 8 ¾ feet. A stratagraphic section was taken which indicated from top to bottom: top coal - 24 inches; gray shale – 13 inches; coal – 2 inches; gray shale – 3 inches; coal - 13 ½ inches; shale – 3 inches; and bottom coal - 42 inches.

The presence of the thick shale layer near the top of the stratagraphic section made rib conditions particularly hazardous. Coal located beneath the shale layer would slough away from the rib, causing large portions of the shale layer to break away. In other areas of the mine, when the top coal or rider was not present or not mined, the ribs appeared relatively stable.

The rib material which fell from the right rib of the number five entry measured: 13 feet long, 7 to 16 inches thick and 40 inches tall. The material fell from the rib from a height of approximately seven feet. When the rib material began to fall, Edmund Vance was positioned approximately 30 inches from the coal rib.

Rib Support

Inspection of other areas of the mine and interviews with miners indicate that the intended method of rib control was to set timbers. The ribs on the active section "worked" and fell rather quickly following coal extraction by the continuous mining machine. The coal ribs were allowed to fall, and then were cleaned up and timbers were set to limit the width of the mine entry to 20 feet.

Twelve injuries due to rib falls had occurred at the mine since January 1, 2002. Eleven of the twelve injuries occurred on the active mining section. The practice of allowing the loose rib material to fall prior to the installation of rib support allowed miners to be exposed to the hazardous rib conditions. In addition to the twelve rib injuries, there were numerous additional near misses and non-injury rib falls which also contacted persons.

Roof Control Plan

Paragraph 24 located on page 5 of the approved roof control plan, dated September 16, 2005, specifically addressed the control of loose or hazardous ribs. The paragraph stated, "where loose ribs are encountered in active working areas, the loose rib will be removed or supported by the following methods: rib boards, metal straps, or plates, or timbers, or angled bolts, or mats or mesh."

The approved roof control plan was not being followed on the active section. Rather than remove or support loose rib material, the loose material was allowed to fall before additional support was installed.

Operator Positioning

The twin head roof bolting machine has two driller stations positioned near the front of the machine. While drilling and installing permanent roof support, roof bolting machine operators are positioned near the front of the machine, beneath an overhead canopy, and between the frame of the machine and the coal rib. Under normal mining conditions, this position is adequate to prevent injury. Because the ribs on the active section "worked" and fell rather quickly following coal extraction by the continuous mining machine, roof bolting machine operators, while drilling and installing permanent roof support, were positioned in a hazardous location between the roof bolting machine and the hazardous rib conditions.

ROOT CAUSE ANALYSIS

An analysis was conducted to identify the most basic cause of the accident that was correctable through management controls. During the analysis, causal factors were identified that, if eliminated, would have either prevented the accident or mitigated its consequences.

Listed below are root causes identified during the analysis and their corresponding corrective actions implemented to prevent a reoccurrence of the accident.

Root Cause: The operator's procedures for controlling loose ribs did not ensure compliance with the approved roof control plan for protecting persons from hazards associated with falls of ribs. The practice of allowing loose rib material to fall prior to the installation of additional support resulted in twelve persons injured from rib rolls during the previous four year period. The current roof control plan required, "where loose ribs are encountered in active working areas, the loose rib will be removed or supported by the following methods: rib boards, metal straps, or plates, or timbers, or angled bolts, or mats or mesh."

Corrective Action: The roof control plan was revised to require the installation of rib bolts installed on four foot maximum spacing on cycle as each row of roof bolts is installed when the mining height is greater than six feet and the overburden thickness is 800 feet or greater. Rib bolts will also be installed when the overburden is less than 800 feet and barrier pillars larger than 1,200 square feet are present in the Campbell's Creek Seam mine above.
Miners received training on the roof control plan to ensure that that rib control precautions are implemented.

Root Cause: The approved roof control plan failed to address the increased overburden pressure which caused the severe rib control problems. The overburden depth of the active section was in excess of 1,100 feet. In addition, overmining in the No. 2 Gas seam concentrated the overburden stress on the active mining section.

Corrective Action: The roof control plan was revised to require the installation of rib bolts installed on four foot maximum spacing on cycle as each row of roof bolts is installed when the mining height is greater than six feet and the overburden thickness is 800 feet or greater. Rib bolts will also be installed when the overburden is less than 800 feet and barrier pillars larger than 1,200 square feet are present in the Campbell's Creek Seam mine above.

Root Cause: The roof bolting equipment provided by the mine operator was not suitable for mining conditions. The procedures for using the 4 Left Mains section roof bolting machine positioned the roof bolting machine operator between the machine and the hazardous rib conditions.

Corrective Action: The mine operator removed the Fletcher Roof Ranger DDO-13 roof bolting machine from the active mining section and provided a Fletcher roof bolting machine model DDR-13-BC-F. This model of roof bolting machine allows roof and rib bolting from a protected position.

CONCLUSION

The accident was caused by the failure to effectively control the ribs on the active section which exposed the victim to hazardous rib conditions. All five entries and cross-cuts of the active working section exhibited deteriorating rib conditions. The coal ribs were not being supported in accordance with the approved roof control plan. The approved roof control plan requires loose ribs to be either removed or supported. The equipment used to install permanent roof support on the active section required the roof bolting machine operator to be positioned between the machine and the hazardous rib condition.

Approved By:

ORIGINAL SIGNED BY
Jesse P. Cole
District Manager

MAY 24, 2006
Date

ENFORCEMENT ACTIONS

1. 103(k) Order No. 7249938 was issued to Long Branch Energy to ensure the safety of all persons until an investigation was completed and the area was deemed safe.

2. A 104(d)(1) citation No. 7168150 was issued to Long Branch Energy for a violation of 75.220(a)(1). The approved roof control plan was not being complied with on the 4 Left Mains section. This condition resulted in a fatal accident on February 1, 2006 to a roof bolting machine operator. Loose, hazardous rib material was present on the active mining section at multiple locations which was allowed to fall prior to the installation of additional rib support. Timbers were not set to prevent exposure to the hazardous rib condition, but rather to limit the width of the mine entry after the hazardous rib material had fallen.

   Prior to the fatal accident, the mine had experienced eleven additional injuries over a four year period due to falling rib material. Deteriorating and hazardous rib conditions were observed in all five entries and all cross-cuts from the last open crosscut to the active faces.

3. A 104(d)(1) Order, No. 7245853 was issued to Long Branch Energy for a violation of 75.362(a)(1). The on-shift records revealed that hazardous ribs had been recorded with little or no corrective action taken to limit or prevent exposure to the hazardous rib conditions. The mine had operated with unusually hazardous rib conditions for a significant period of time. Mine management had discussed obtaining equipment to install rib bolts but had taken no action. The mine operator exhibited a high degree of negligence by allowing miners to be exposed to the hazardous rib conditions over an extended time period. The hazardous rib conditions were present across the entire active mining section. Despite the extensive presence of the hazardous rib conditions, loose rib material was not removed or supported in accordance with the approved roof control plan.

APPENDIX A

Listed below are the persons furnishing information and/or were present during the investigation:

Long Branch Energy

Greg Patterson.....President
Phillip Ball.....Mine Superintendent
Elmer Bourne.....General Mine Foreman
Steve Lafferty.....Section Foreman-A Crew
Worley Miller.....Continuous Miner Operator
Randall Brogan.....Continuous Miner Operator Helper
Timothy Vance.....Roof Bolter Operator
James Jackson.....Scoop Operator
Gary Mullens.....Scoop Operator
Roger Green.....Outby Scoop Operator
Willard Bourne.....Section Foreman-B Crew
Dennie Lilly.....Roof Bolter Operator
Steve Scott.....Roof Bolter Operator
Dave Toler.....Scoop Operator
Arby Williams.....Roof Bolter Operator-C Crew
Bobby Vickers.....Scoop Operator

United Mine Workers of America

Joe Carter.....District Representative
Gary Young.....District Representative
Danny Breedlove.....President-Local 781
Ray Bennett.....Safety Committeeman
Roger Green.....Safety Committeeman

P&A Engineers and Consultants

Shelley Bowling.....Surveyor
Richard Williams.....Surveyor
Terry Weaver.....Surveyor
Ernest Banks.....Surveyor
Glen Jarvis.....Surveyor

Jackson Kelly-Attorneys at Law

Julia Shreve.....Attorney
John Mairs.....Attorney

West Virginia Office of Miners' Health, Safety, and Training

Terry Farley ..... Health and Safety Administrator
Harry Linville.....Inspector-at-Large
Larry McKnight ..... Roof Control Inspector
Harrison Stollings .....District Inspector
Andrew Sparks.....District Inspector
Willie Barker.....Safety Instructor

Mine Safety and Health Administration

Jesse P. Cole..... District Manager
Luther Marrs .....Assistant District Manager
Terry Price .....Madison Field Office Supervisor
Gerald L. Cook, Sr. .....Accident Investigator/Inspector
Douglas W. Johnson .....Accident Investigator/Inspector
Bobby Moreland .....Accident Investigator/Inspector
Charles W. Cline.....Roof Control Specialist
Clyde Gray.....Coal Mine Inspector